

WHAT IS CLAIMED IS:

1. A detector apparatus comprising: a detector for detecting trace amounts of particles of interest carried on a stream of air; two dryers in communication with the stream of air; at least one valve in communication with the dryers for selectively placing a first of the dryers in communication with the detector; and at least one heater for selectively recharging a second of the dryers while the first dryer is in communication with the detector.
2. The apparatus of claim 1, wherein the valve is a five-way valve for directing a first portion of dried air produced by the dryer that is in communication with the detector towards the detector while directing a second portion of the dried air from the dryer that is in communication with the detector toward the other of the dryers for transporting moisture from the other dryer.
3. The apparatus of claim 1, wherein the detector is an ion trap mobility spectrometer.
4. The apparatus of claim 1, further comprising a timer connected to the valve for alternately placing the first and second dryers in communication with the detector after a selected time.
5. The apparatus of claim 1, further comprising a humidity measurer for measuring humidity in the stream of air, the humidity measurer being operative to operate the valve at a selected humidity level.
6. The apparatus of claim 1, wherein the heater is operative for selectively heating the dryers to a temperature greater than 100°C.

7. The apparatus of claim 1, wherein the at least one heater comprises first and second heaters for selectively heating the first and second dryers respectively.

8. The apparatus of claim 1, wherein each of the dryers is operative for removing moisture from the stream of air and wherein each of the heaters is operative for heating the dryers sufficiently for vaporizing moisture collected in the respective dryer so that the vaporized moisture can be purged from the respective dryer.

9. A detector apparatus comprising: a detector for detecting trace amounts of particles of interest carried on a stream of air; two dryers in communication with the stream of air for removing moisture from the stream of air, such that each said dryer produces a stream of substantially dry air; at least one valve in communication with the dryers for selectively placing a first of the dryers in communication with the detector; and two heaters associated respectively with the dryers for heating the dryers sufficiently for vaporizing moisture collected therein and enabling the vaporized moisture to be purged from the respective dryer, whereby the dryer and heaters are operated alternately for enabling a substantially continuous stream of dried air to be in communication with the detector and enabling substantially continuous operation of the detector.

10. The apparatus of claim 9, further comprising a timer connected to the valve for alternately placing the first and second dryers in communication with the detector after a selected time.

11. The apparatus of claim 9, further comprising a humidity measurer for measuring humidity in the stream of air, the humidity measurer being operative to operate the valve at a selected humidity level.

12. A detector apparatus having a detector for detecting trace amounts of materials of interest carried into the detector through a detector inlet on a stream of air, the detector apparatus comprising traps formed from a material for collecting said materials of interest, a desorber having an inlet for communicating with one of the traps to be tested for the materials of interest and an outlet communicating with the detector inlet, the desorber including a manifold communicating with the inlet to the desorber for directing air from the manifold and across the inlet to the desorber, a heater for heating the desorber to evaporate any of the materials of interest on the trap, a pump for carrying the materials of interest on the air and into the detector; and a dryer assembly for drying air directed into the desorber, the dryer assembly comprising at least first and second dryers and at least one valve for selectively placing one of the first and second dryers in communication with the desorber while substantially isolating the other of the first and second dryers from the desorber.

13. The apparatus of claim 12, further comprising first and second heaters in proximity to the respective first and second dryers and being selectively operable for recharging the dryers.

14. The apparatus of claim 13, wherein the detector is an ion mobility spectrometer.

15. The apparatus of claim 13, wherein the detector is an ion trap mobility spectrometer.

16. The apparatus of claim 13, wherein the inlet of the desorber has a plurality of small holes for directing dry air from the manifold.

17. The apparatus of claim 13, further comprising a timer connected to the valve for alternately placing the first and second dryers in communication with the detector after a selected time.

18. The apparatus of claim 13, further comprising a humidity measurer for measuring humidity in the stream of air, the humidity measurer being operative to operate the valve at a selected humidity level.

19. The apparatus of claim 13, wherein the inlet to the desorber is a narrow slot.

20. A method for continuously operating a detector for detecting particles of interest, said method comprising:

operating one of first and second dryers for defining an operated dryer and a non-operated dryer;

directing a stream of air through the operated dryer for transferring moisture from the stream of air to the operated dryer to produce a stream of dry air;

directing the stream of dry air from the operated dryer toward an object to be tested for particles of interest and then toward the detector;

recharging the non-operated dryer; and

switching the stream of air from one of the dryers to the other after the non-operated dryer has been at least partially recharged and before the operated dryer has become saturated.

21. The method of claim 20, wherein the switching step is carried out after passage of a selected period of time.

22. The method of claim 20, wherein the switching step is carried out based on a measurement of moisture in the stream of dry air.

23. The method of claim 20, wherein the re-charging step comprises heating the non-operated dryer to a temperature of at least 100°C.

24. A method for continuously operating a detector for detecting whether an object has any particles of interest, said method comprising:

operating a first dryer;

directing a stream of air through the first dryer for transferring water from the stream of air to the first dryer;

recharging a second dryer for purging water from the second dryer while the stream of air is directed through the first dryer; and

redirecting the stream of air through the second dryer after the second dryer has been at least partly recharged and before the first dryer has become saturated with water; and

recharging the first dryer while the stream of air is directed through the second dryer.

25. A method for continuously operating a detector for detecting particles of interest, said method comprising:

operating a first dryer for producing a first flow of dried air;

directing a first portion of the first flow of dried air towards the detector for delivering potential particles of interest into the detector;

directing a second portion of the first flow of dried air through a second dryer and simultaneously heating the second dryer sufficiently for liberating water from the second dryer;

terminating the first flow of dried air from the first dryer and operating the second dryer for producing a second flow of dried air;

directing a first portion of the second flow of dried air towards the detector for transporting potential particles of interest into the detector;

diverting a second portion of the second flow of dried air from the second dryer to the first dryer and simultaneously heating the first dryer for liberating moisture from the first dryer, whereby the first and second dryers are operated sequentially prior to either of the first and second dryers being saturated for permitting continuous operation of the detector.